THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

How are weather forecasts created?

By Darin Langerud

You see them on television and in the newspaper. You hear them on the radio. For something that's going to happen anyway, we sure are interested in knowing about it ahead of time. Everyone knows a little something about the weather, but what, exactly, goes into making a weather forecast?

With all of the equipment and data available to meteorologists nowadays, it should be easy, right? Well, as they say in the Hertz car rental commercials, 'not exactly.' Weather forecasting can be as much an art as it is a science. Knowing which computer model to 'believe' can be as important as the information it contains. There are infinite wrong conclusions and only one right one.

The advent of the computer revolutionized the way weather forecasting is done. Supercomputers at the National Centers for Environme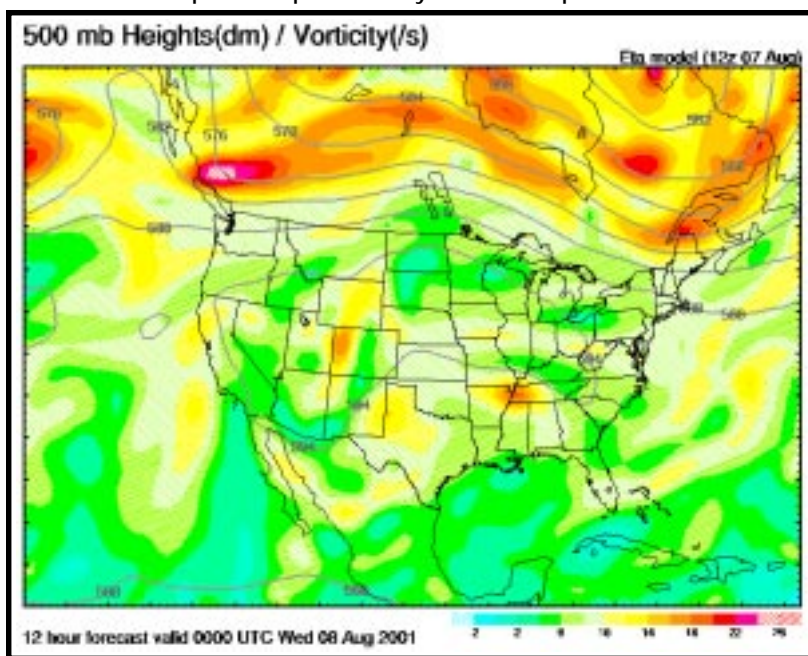ntal Prediction (NCEP), in Camp Springs, Maryland, import data from weather balloons, observation stations, radars, and satellites continuously every day. Data are sifted through complex models that simu-

A middle-atmosphere map created by the ETA computer model.

late atmospheric processes through mathematical equations. Volumes of predicted atmospheric parameters result. These models have names such as AVN, ETA, MRF, NGM, and RUC. Most of the models are run every twelve hours, with the RUC model run most frequently, every three hours. While they all have the same goal of correctly predicting the weather, they differ from one another in subtle, yet important ways. It is the meteorologist's job to review all of this information and decide if one model, or a blend of models, provides the most reasonable result for the forecast period.

Even with all the high-tech information now available, experience, and knowledge of the area for which the forecast is meant are equally important. Development of relatively small scale phenomena, such as thunderstorms or valley fogs, for example, are oftentimes dependent on the terrain in a localized area. These contributing factors can easily be missed by the computer models, but can greatly enhance the validity of a forecast if they are properly accounted for by the meteorologist. The meteorologist is continually adding value to the computer forecasts through virtue of these somewhat esoteric details.

Current forecasting technology is allowing meteorologists to do a good job of predicting the weather five days in advance. Considering all the variables that exist in the atmosphere and affect its weather, it is an amazing achievement. NCEP's goals by 2005 is to help meteorologists produce reliable forecasts out to seven days and climate forecasts out to one year. This is no doubt a tall task, but through further improvements to computer models and better understanding our atmosphere through research, it is an achievable one. ■

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